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AIRPORTS AND COMMUNITY PLANNING

by Walther Prokosch

Editor's Note

Developments in aviation and their effect on land development is one of the most rapidly changing elements with which the planner and community developer must deal. For this reason URBAN LAND believes a periodic review of trends in this field is highly desirable. (See URBAN LAND issues: July-August, 1945; December, 1946; September, 1947; and March, 1948.)

The current evaluation of this subject has been prepared for URBAN LAND by Walther Prokosch, Associate in charge of Airport Planning and Design of the firm of the Knappen, Tippetts, Abbett Engineering Company of New York. Mr. Prokosch has had wide experience in the planning, design, and construction of all types of airport facilities both here and abroad. His previous connections include those with George S. Armstrong and Co., Industrial Engineers, Eastern Air Lines, and Fairchild Engine and Airplane Corp. He is the co-author of "AIRPORT PLANNING" and of various articles on airport design. His views on this subject should be of great interest to all URBAN LAND readers.

Re-Appraisal Required

The dynamic character of aeronautics requires a re-appraisal every few years of the relationship of airports to the community pattern. A single example will point the changes in airport planning resulting from the continuing development of aircraft. Not many years ago it was believed that runways in four directions were required in order to furnish complete coverage for all wind conditions. Then, runways in three directions were held sufficient. Now a two-directional runway system is generally acceptable; and the uni-directional runway airport, from presently available knowledge, will meet the aeronautical requirements of the future.

Since changes in concept of airport planning have a profound effect upon the proper integration of airports with community planning, and since these changes result from developments in the vehicle itself, it becomes our first interest to inquire into the recent and predictable evolution of aircraft—both commercial and private. Our second inquiry must be directed at an evaluation of changes in air transport—both commercial and private. A third point of investigation will be the developments in navigational aids and their effect upon airport design—both commercial and private.

Reduction of Runways

The most important factor which has permitted the reduction in number of runway directions is the development of and now almost universal use of the tricycle landing gear in commercial-type airplanes. This design, coupled with higher gross weights and higher landing speeds, permits airplanes to land with cross winds of higher velocity. Bicycle landing gear, used so far for military aircraft, may be expected to further the ability to land with high cross winds, when applied to commercial-type airplanes.

The reduction in the number of runway directions required has simplified the problem of airport design and has reduced the acreage required for airport development. But, simultaneously, runway lengths have been increasing. Every few years cities are being asked to add to the length of at least the principal runway—often at considerable expense because of extra property required for construction and, additionally, for approach clearances. "When will this process stop?" many city administrations are asking. The author believes that the limit in runway length requirements is being reached. First, the designers of aircraft have become aware of the economic problem resulting from their designs which require greater and greater runway length. Second, mechanical devices are beginning to be used to shorten the runway required, such as the reversible propeller and the tail parachute for braking and jets for assistance in take-off. Third, the CAA has adopted the policy of limiting Federal aid to airport construction to runways no longer than those specified in Technical Standard Order—N6 rev.—a serious deterrent! Fourth, the airlines are becoming increasingly community-relations conscious and are husbanding the goodwill remaining at local levels. Thus, a city can be reasonably sure that the runway length it provides under present standards will suffice for the future—provided the category of transport service it will require has been correctly predicted.

Effect of Jet Engines

Recently, the author visited the L. V. Roe Company of Canada in Toronto—the designers and builders of the first transport airplane in this hemisphere using jet engines. The purpose of this visit was to discuss with the Company's technical personnel the probable effects

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Plan-itorial . . .

The Annual Meeting

The annual meeting of the Urban Land Institute Board of Trustees was held in Washington, D. C., January 8, 1950.

The following officers were elected for 1950:

President, Richard J. Seltzer, Philadelphia; Vice-President, Foster Winter, Detroit; Vice-President, Warren L. Morris, Cleveland; Secretary, Herbert U. Nelson, Chicago; and Treasurer, L. D. McKendry, Chicago.

Newly elected trustees were Charles Fleetwood, vice-president of the Prudential Insurance Company of America, Newark; Dr. Ernest M. Fisher, director of the Institute for Urban Land Use and Housing Studies, Columbia University, New York; and J. Truman Streng, vice-president of the Massachusetts Mutual Life Insurance Company, Springfield, Massachusetts. Trustees re-elected to the Board were: William H. Ballard, Boston; Van Holt Garrett, Denver; Newton C. Farr, Chicago; Philip W. Kniskern, Philadelphia; Warren L. Morris, Cleveland; Walter S. Schmidt, Cincinnati; Howard J. Tobin, Milwaukee; A. J. Stewart, Louisville; and Frank H. Ayres, Los Angeles.

After the election of officers and the reports on Institute affairs, a most interesting talk was given by Mr. Richard U. Ratcliff, Director of Housing Research, Housing and Home Finance Agency, on the proposed program of his new organization. Mr. Seltzer pledged the full cooperation of the Institute.

In discussing the Institute's program for 1950, President Seltzer announced the acceptance by the Institute of an invitation from Dallas businessmen to hold a Panel Session of the Central Business District Council in May. This would be similar to the Panels previously held in Louisville, Richmond, Indianapolis and Wichita. A study of such problems as traffic, parking, and transportation will be made by this group and recommendations made in a meeting open to city officials and business leaders.

Mr. Seltzer also stated, "Our technical staff, the Community Builders' Council, and the Central Business District Council, will continue their splendid work in the study of problems affecting the growth and development of American cities." "This year there will be particular emphasis on urban redevelopment, traffic and parking problems, and industrial and residential dispersion," he pointed out. Another major segment of the Institute's program will be the preparation of a working guide for the National Association of Real Estate Boards to aid local real estate boards in moving ahead in neighborhood reclamation, rehabilitation, and slum prevention work.

Regarding the Community Builders' Council, Mr. Seltzer said, "it is planned to hold several meetings to assist developers in their land planning and building programs. Those who join this Council," he continued, "have the privilege of presenting their plans and development problems to a panel of outstanding operators and securing their advice and counsel. This is the first time that a service of this kind has ever been made available to the builders of America." S.H.M.

Community Builders' Council to Hold Plan Analysis Session, February 22, 1950

All members of the Community Builders' Council are invited to present their site plans and development programs to a Panel of experienced operators at a Plan Analysis Session to be held at the Stevens Hotel, Chicago, Illinois, February 22. This session coincides with the Home Builders Annual Convention.

The Chairman of the Panel will be Hugh Potter of Houston, Texas. Working with him will be such nationally known operators as David Bohannon, Fritz Burns, Waverly Taylor, Robert Gerholz and others of comparable experience.

This is a unique opportunity to secure an invaluable service. Members of the Council who wish to present their plans are urged to notify the Institute at once.

This service must be limited to Sustaining Members and members of the Community Builders' Council. Those wishing to present projects for analysis who are not members, may write to the Urban Land Institute, 1737 K Street, N. W., Washington, 6, D. C. for membership application forms.

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Residential Development and Traffic Safety

"The provision of attractive homes in residential subdivisions, where families can live comfortably and with the privacy, beauty and repose sought by most home owners, is not incompatible with high standards of traffic safety. On the contrary, the absence of traffic hazards and inconveniences will enhance these qualities of 'liveability' and so improve property values."

This statement forms the keynote of an unusually worthwhile booklet which should be on the desk of every land developer, planning commission and traffic engineer. Written from the traffic safety angle, the publication verifies and supports many of the recommendations of the Community Builders' Council regarding such land planning items as block lengths, street and sidewalk widths, off-street parking and shopping center layout. The Urban Land Institute participated in the preparation of the text. Land Developers will find it a practical, down-to-earth guide to building safety into their residential communities. The booklet can be obtained from the National Committee for Traffic Safety, 20 N. Wacker Drive, Chicago 6, Illinois for $1.00; discount for large quantities.

AIRPORTS AND COMMUNITY PLANNING

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which this type of aircraft will have on airport design in the future. From these discussions the following conclusions have been drawn: (a) The effect of jet engine blast on paving is not serious—any type of hard-surface paving may be used for aprons, taxiways, and runways; only in maintenance areas will special provisions be required for engine run-up and testing; (b) In general, runway lengths now prescribed for transport operations will suffice; (c) Terminal operations will require considerable study and evaluation, but the effect on terminal design will not be of a radical nature; (d) Integration of the jet-type aircraft with air traffic control presents serious problems which are now under study. However, this will not affect airport design too directly. In summation, the well-designed airport of today which possesses runways of adequate length with clear approaches will be able to accommodate the jet air-liner in the future.

Increase in Traffic

Although the growth in passenger air traffic has not increased as rapidly as was estimated near the close of the war, it has nevertheless climbed to heights which would have appeared as speculations of wild fancy fifteen years ago. And, for areas of geographic isolation, such as Charleston, W. Va., the growth has been—to use a well-worn term—phenomenal. It is anticipated that passenger traffic will increase 60 per cent by 1955, and will attain a plateau of approximately 25 per cent of the population in the early 1960's. These, of course, are general, nation-wide figures. For communities which have had depressed traffic figures because of inadequate airports, the rate of rise may be greater.

This increase in passenger traffic will mean, at minimum, increased terminal building requirements; and in many cases entirely new airports. These new airports will be required either because existing ones cannot be expanded economically to accommodate new airplane types or the increase in passenger traffic, or because the new member of the family, air freight, is crowding the older one out of house and home. And what about air freight? What effect will this type of traffic have on city planning? Without exception, every type of ground transportation has eventually required separate terminals for the handling of passengers and freight as the machine and as traffic developed. There are no characteristics discernible on the horizon which would change the pattern for development in air transport. The wise city planner will make provisions now for the eventual existence of separate passenger and freight airports—at least for metropolitan districts. The wise city administrator will purchase land now which will be required in the future for separate terminals.

Location of Airports

As to location, the close integration of airports with belt and radial arterial highway systems (which every progressive city is planning and building) appears obvious, since the ground time required to travel from a given airport to its traffic generating center or centers is more important than the actual distance traversed. No hard and fast rules can be laid down for achieving optimum locations; each area must be studied separately and the solution based upon local geographic, topographic and economic conditions. However, one note of caution may be introduced at this point. In the past, the greater proportion of passenger traffic gave indication of originating and terminating in the central hotel and business districts of a city. As traffic volume increases, the travel and economic base broadens and increasing numbers of air passengers are drawn from those who are making private trips—to visit friends or relatives or for vacations; the travelling business man becomes proportionately less of a factor. Thus, it would appear desirable to choose the location of a passenger terminal with greater regard for access to residential areas.

Aids to navigation are being developed on a long-term basis in accordance with the principles described in the masterful Report of the Radio Technical Committee for Aeronautics—Special Committee 31. The item of major interest in this Report as it affects the planning of airports is that all commercial-type fields will be knit together with completely integrated system of navigation which will permit flight from airport to airport entirely with the use of instruments and irrespective of weather. For the planner this means that the airport of the future with its unidirectional runway system (except for areas of unusual wind conditions) will require a system of approach lighting at *each* end of the runway. Each approach lighting installation will extend 3,000 feet beyond the ends of the runway. This fact coupled with approach zone clearances of 50 to 1 will mean that a considerable length of ground will be required—either by purchase or easement in addition to the basic requirement for the runway proper. This will mean, further, that the lanes of traffic in the air will be more circumscribed so that it will be possible to plan for a minimum of airborne annoyance.

Future of the Private Plane

Turning to the consideration of the field of air transport with smaller, private-type aircraft, we find that earlier predictions of rapid increases in registration are not being realized. Does this mean that private flying will never amount to much, or that we will not require the large number of private-flying airports which were considered to be a future necessity? An examination of the machine as it now is designed and a look into the future may provide the answer for our questions.

Undoubtedly, the disappointing growth curve for private aircraft and the closing of numerous small airfields may be traced directly to the airplane itself. The post-war airplane is not less expensive in first cost than its pre-war counterpart; it is no less expensive to operate; it is no easier to fly; it is not safer; it does not produce less noise; it does not require less ground space for operation. All of these conditions must be improved before public acceptance increases. Here and there promising technological advances are being made: the development of the stall warning indicator and the castering landing gear, both by the CAA; the noiseless airplane by Aeronautical Research Foundation at Cambridge, Massachusetts. But, basically, the airplane remains the same. It cannot stop in mid-air if confronted with a dangerous situation; it is still much too dependent upon the weather. We can be assured that American technological ingenuity will provide, in time, the machine to fit the requirements. Until that day arrives, there will be no dramatic upward surge in the statistical picture insofar as metropolitan districts and city development are concerned.

The Airplane and Agriculture

The rapid increase in the utilization of the light airplane for farming must, however, be regarded seriously. In the fields of crop dusting, cattle herding, crop planting and allied activities, the picture is bright indeed. Testimony to this fact is given by the vigorous activities of the recently formed Flying Farmers Association and by the development sponsored co-jointly by the Civil Aeronautics Administration and the U. S. Department of Agriculture of

an airplane designed specifically for the farmer. At present the greatest activity in this respect is in the Middle and Far West where great distances combine with large farm areas to bring forth maximum utility for this newest of the farmer's aids.

Special Uses

The more general use of the light plane in urban areas will, nevertheless, be for instructional purposes, safety (Police), charter flying, and "week-end" private flying. (The company-owned, executive airplane will probably be based at the commercial-passenger or freight airport since it will be flown by professional pilots and will be equipped with full instrumentation.) For some time to come, the privately owned airplane will continue to occupy a position analogous to the private boat: it will be purchased only after the more essential necessities have been acquired; and it will be flown primarily during leisure time as a sport rather than as an essential means of getting from one place to another.

The technological developments previously mentioned for light planes *will* occur, and when they do a rapid acceptance may be predicted with safety. The problem will then become more acute as to the best method of providing additional airfields for this type of flying activity. As with the commercial airplane, the directional requirements for landing are becoming less stringent, and it is reasonably safe to predict that a single strip will suffice except for unusual situations. But this strip, to provide greatest safety should be wider and longer than the minimum presently required; and its approaches should be clear on an angle of at least 20 to 1, and preferably 30 to 1. The strip should be hard surfaced and equipped with at least a minimum of night lighting. Since only two paths of approach will be required it should be possible to align these so that they will be over open areas such as parks, cemeteries or golf courses. They should not be over homes, schools or other community buildings.

The Private Field

However, the airport designed for private flying should not be banished from the area which it will serve. It is possible to effect a neighborhood design in which the airport will be a good neighbor and will not affect real estate values adversely. The location of the airport should render it convenient to its users just as the marina should be convenient to the small-boat owner. The greatest deterrents in this approach in the past have been the factors of noise and danger. The first, noise, is in the process of solution now. If serious demands were made it should be possible to accomplish legal requirements for the installation of noise-reducing mufflers and propellors just as the muffler is required for the engine of an automobile. Regarding danger, the spin-proof airplane and the stall-warning device are only two indications that real progress is being made in this direction. In addition, the careful planning of approach zones will limit any residual danger factors to the occupants of the craft itself. Finally, it might be cited that the extermination of some 50,000 persons per year by the automobile has not acted as a deterrent in the use of that machine. Improvements in navigational aids contemplated by SC-31 are not limited to the commercial airplane; the smaller craft is also included in the overall plan. This fact together with improvements in the private-type airplane, increased proficiency in flying plus safer airports will make private flying statistically safer than driving an automobile.

Effect on Land Values

The effect of airports on surrounding real estate has been the subject of much discussion. That airports have had a depressing effect in certain cases can obviously be proven. However, three facts should be borne in mind when considering this problem from an overall point of view. First, in the past airports have mostly just "growed"; they were not planned from a general community viewpoint. As often as not their location resulted from the availability of a somewhat suitable piece of acreage which the private sponsor could obtain and develop cheaply and with no restrictions of any kind. Second, airports as we have generally come to know them, have catered to all types of flying—instructional, private, charter, commercial, and many others. Third, the airplane of the past was noisy and considerably less than 100 per cent safe.

The very beneficial effect upon surrounding real-estate of a well conceived and comprehensively planned transportation terminal such as Grand Central in New York is obvious. The same can be done for the air passenger terminal. And, with good planning again, the air freight terminal need never give rise to the blighted residential areas which surround so many of our railroad freight yards today.

The well-planned neighborhood or community of today is a considerably different one than the type which was built several decades ago. Many community facilities are now included which were left to chance before. The proper integration of schools, shopping centers, desirable industries, parking facilities, civic buildings, parks and playgrounds together with residential areas is developing an urban pattern which promises a happier and fuller life for the residents. The airplane is here to stay; provisions will be made for requisite ground facilities. In the hands of the skillful and knowledgeable planner, the private airport will become another element which can enhance the community pattern.

Summary

The foregoing discussion may be summarized briefly as follows:

1. Except for areas of unusual wind conditions, a uni-directional runway system will function successfully for commercial-type airports now, and for private-type airports in the not-too-distant future.

2. Jet-powered transport aircraft may be successfully handled at airports with runways of adequate length and approach slope clearances.

3. The increase in commercial air passenger traffic—nationally—will be approximately 60 per cent over the present traffic by 1955.

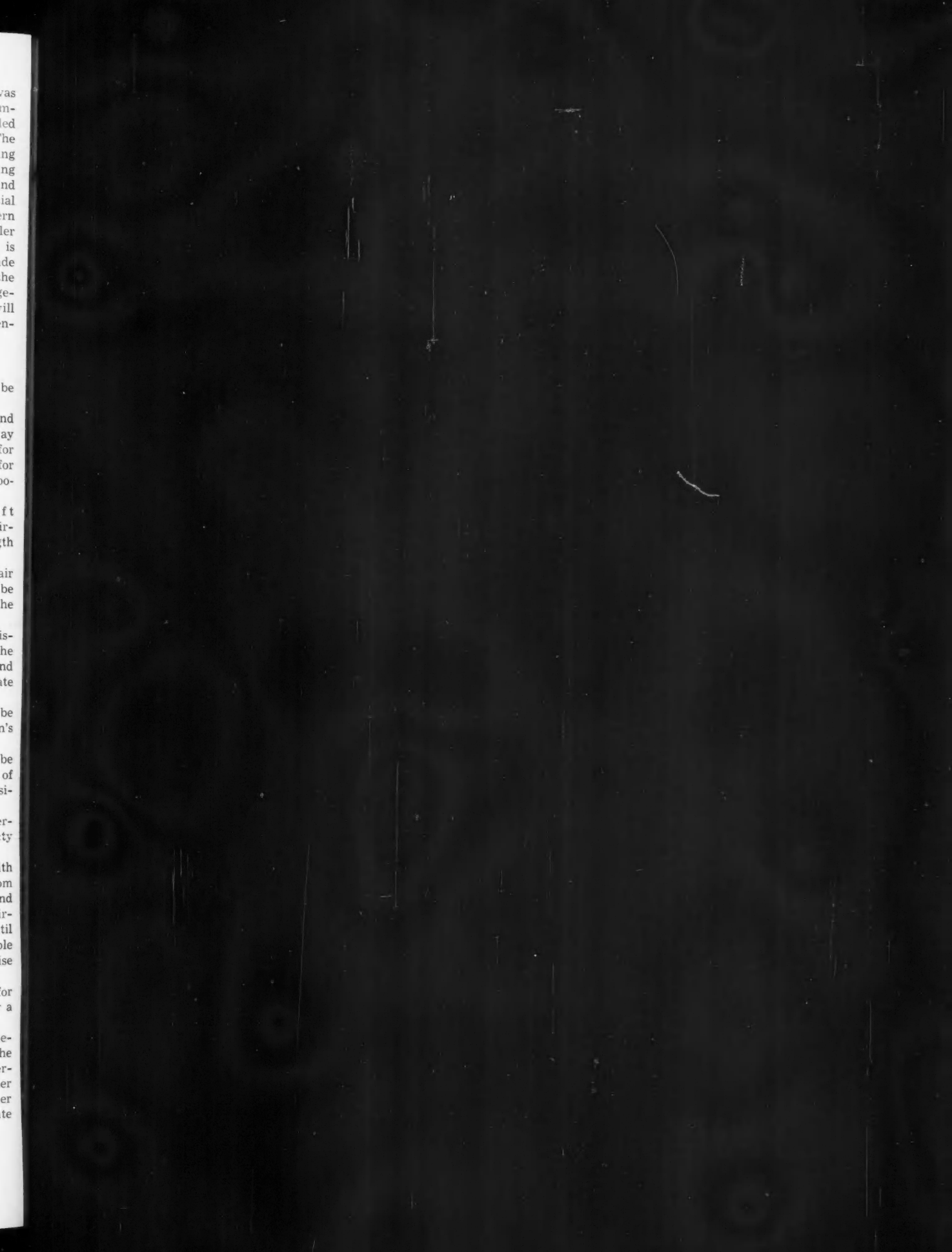
4. For the larger metropolitan districts, provisions should be made for the future segregation of air passenger and air freight traffic by means of separate airports.

5. All commercial airports should be carefully integrated with the region's expressway system.

6. Greater consideration should be given in the future to the location of passenger airports with respect to residential areas of the region served.

7. Future navigational aids will permit all-weather operation with safety and reliability.

8. In the field of private flying, with respect to metropolitan areas, no boom in the number of aircraft in use and therefore in the number of smaller airfields required may be anticipated until the basic aircraft shows considerable improvement—in first cost, safety, noise level and operating cost.

9. The use of the small airplane for various farming operations will show a marked increase.

10. With proper planning, plus adequate regulations strictly enforced, the airport can be integrated with the overall community plan in such a manner that its presence will enhance rather than depress adjacent real estate values.